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Survey of Mollusks of the Niobrara River: Final Report

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SURVEY OF MOLLUSKS OF THE NIOBRARA RIVER

FINAL REPORT

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Attention Mr. Steve Anschutz

Survey of Mollusks of the Niobrara River

Summary

We surveyed the mollusks of the Niobrara River in Nebraska from 1992–1996. We found two species of unionid clams and ten species of snails that either must live in water or near water. Both clams and snails are poorly sampled in the state, however we attribute the low number of species of unionid clams in the Niobrara to its cold, fast flow and rocky bottom. In contrast, the Platte River is slower moving with a muddy bottom and has at least 11 species of unionid clams. Each species has been mapped with latitude/longitude coordinates. Specimens have been curated and are housed in the Division of Zoology of the University of Nebraska State Museum.

Survey of the Mollusks of the Niobrara River Valley

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Collecting occurred from 1992 to 1996. Latitude and longitude were derived by a combination of verbal description in Perkins field notes (and archived at the University of Nebraska State Museum) and the township/range. We did not have a geographic positioning system (GPS) unit available for most of the length of this project. Some of the Lat/Long localities appear the same, but field notes explain that the actual spot is 100 or so meters further away. We had no way to accurately pinpoint such small distances, but we did assign different collection site numbers to indicate the slightly different sites. Specimens from this survey are housed in the Division of Zoology at the University of Nebraska State Museum. A table of all species and localities appears in Table 1. Maps (Figs. 1–14) were generated by ARCVIEW by Mary Anne Andrei with the help of specialists in the Center for Advanced Land Management Information Technologies (CALMIT), which is part of the Conservation and Survey Division, University ofNebraska–Lincoln. We are grateful to both for their help.

Unionid clams

Only two species of clams were found at two sites on the Niobrara river of the 20 sites sampled (Figs. 1–4). Those species were *Anodonta grandis grandis* and *Strophitus undulatus.* The possible reason for the paucity of species and individuals as compared to the 11 species found in the Platte River (Freeman and Perkins, 1992) may be the nature of the river itself. The Niobrara is a cold river with a rocky bottom, shifting sands, and fast current. The water temperature is significantly cooler for its entire length compared the the warmer, muddier-bottomed, slower-moving Platte. No species were found at the mouth of the Niobrara, which was a surprise. Usually clams are more common toward the mouth of a river. We surveyed many backwaters at the mouth and found no clams.

Anodonta grandis grandis was found only in the creek below the dam at the Valentine City Park in Cherry county (1994-1; Figs. 2, 3). There was a lot of marl, calcium carbonate, in the water and the clams were marly and thick-shelled. We suspect that there is a change in the reduction-oxidation potential attributable to the aeration in the water as it comes through the dam and causes precipitation of calcium carbonate. An abundance of calcium carbonate would account for both the marl and the production of thick-shelled clams. It could also be the reason the clams are there in the first place.

Stophitus undulatus was found further west on the Niobrara at Agate, in Sioux county (1992-5; Figs. 2, 4) where they were fairly abundant. Ten to 12 live specimens were taken and 30 to 40 were left. This species typically occurs in headwaters that

are more pristine and colder. This species was barely present in our survey on the Platte where only one dead shell was found (Freeman and Perkins, 1992). This may be the westernmost extent of the range for this species

Gastropods

Ten species of snails were collected in the Niobrara River Valley. We found sixteen species along the Platte. Nebraska in general has been poorly collected for mollusks in general and gastropods in particular (Hubricht, 1985).

Freshwater snails

Valvatidae

Valvata tricarinata (threeridge valvata)

This freshwater snail was found along the Niobrara or near a tributary in the western part of Nebraska (in Cottonwood Lake near Bear Creek in Cherry county; Fig. 5). This is consistent with earlier records that are listed by Burch and Wu, In litt.

Lymnaeidae

Fossaria obrussa (golden fossaria)

Found on both the eastern and western ends of the Niobrara in Nebraska but not in between (Fig. 6). Historically, it was found in areas in between, particularly in Cherry and Brown Counties. We do not know if this is a result of.sampling or whether the species is now missing from areas where it occurred previously.

Stagnicola elodes (marsh pondsnail)

Found on the western half of the Niobrara, but it is a species also found on the Platte River (Fig. 7). It is typical of shallow backwaters and temporary pools. Historically, this species was found in Cherry County. Its range may have expanded west.

Physidae

Physella gyrina (tadpole physa)

Found along the entire length of the Niobrara in Nebraska (Fig. 8). This species is typical of shallow backwaters, slow moving waters, and temporary pools. Historically, it was found in Brown and Cherry counties.

Planorbidae

Helisoma anceps (two-ridge rams-horn)

Also found on the western half of the Niobrara (Fig. 9). It was also found historically in Cherry County .

Land-snails

Succineidae

Oxyloma retusum (blunt ambersnail)

We found this snail and the eastern and western ends of the Niobrara but not in between (Fig. 10). However, historically this land snail was found near Valentine in Cherry county. The western record is the westernmost record for the state. This species prefers wet situations such as marshes, low areas, and pond edges where it can crawl on mud or plants such as cattails near the water.

Succinea ovalis (oval ambersnail)
Found along the entire length of the Niobrara in Nebraska (Fig. 11). It was also found in Brown County on the Niobrara in an earlier study (Taylor, 1960). This species is typically found near water but can also be found on wooded hillsides.

Vitrinidae (Zonitidae)
Paravitrea simpsoni (amber supercoil)
Found only at the mouth of the Niobrara in Nebraska (Fig. 12). This species was also found on the eastern end of the Platte River (Freeman and Perkins, 1992). These may be northern records for this species (Hubricht, 1985). This snail is typically found under leaflitter on wooded hillsides and in ravines.

Discidae
Anguispira alternata (flamed disc)
Found only at the mouth of the Niobrara in Nebraska (Fig. 13). Hubricht (1985) lists other records in eastern Nebraska, but the species appears to reach the western edge of a more eastern distribution here. It is a species with wide tolerance of habitat including wooded areas around logs, hollow trees, and rocks as well as weedy roadsides
and vacant lots. It also has substantial morphological variation.

Mesodontidae
Stenotrema leai (Lea's slitmouth)
Found at the mouth of the Niobrara and further west on the river in Knox county (Fig. 14). It is another species at the western edge of a more eastern US distribution. The species prefers low, wet habitats and floodplains. This species was also found in Nebraska on the Platte (Freeman and Perkins, 1992) and previously in Cherry County (Taylor, 1960).

Literature cited

Burch, J. B., and S.-K Wu.. In litt. Mollusks of Nebraska. 1990: 36 pp.

Freeman, P. W. and K. Perkins. 1992. Survey of mollusks of the Platte River. Final Report. U. S. Fish and Wildlife Service, Grand Island, NE. 37 pp.

Hubricht, L. 1985. The distributions of the native land mollusks of eastern United States. Fieldiana, Zoology .New series 24: 191 pp.

Taylor, D. W. 1960 Late Cenozoic molluscan faunas from the High Plains. U.S. Geol. Surv., Prof. Paper, 337: 94 pp.

Table 1

MOLLUSKS COLLECTED ON THE NIOBRARA RIVER

COLLECTION SITE	TAXA	LONGITUDE	LATITUDE	USGS 7.5 MIN. QUAD	COUNTY
	UNIONIDS COLLECTED				
1992-5	Strophitus undulatus undulatus (Say, 1817)	103.81778	42.43194	Agate	Sioux
1994-1	Anodonta grandis grandis Say, 1829	100.54583	42.88639	Valentine N.	Cherry
	GASTROPODS COLLECTED				
1991-29	Valvata tricarinata (Say, 1817) Stagnicola elodes (Say, 1821) Physella gyrina (Say, 1821) Helisoma anceps (Menke, 1830)	103.07083	42.45667	Box Butte Reservoir E.	Dawes
1991-30	Stagnicola elodes (Say, 1821) Physella gyrina (Say, 1821) Helisoma anceps (Menke, 1830) Succinea ovalis Say, 1817	103.08889	42.46472	Box Butte Reservoir E.	Dawes
1992-1	Physella gyrina (Say, 1821)	100.48111 100.46694 100.45139 100.42028 100.41028	42.90056 42.90139 42.90694 42.90556 42.90806	Cornell Dam Cornell Dam Cornell Dam Cornell Dam Cornell Dam	Cherry
1992-2	Stagnicola elodes (Say, 1821) Physella gyrina (Say, 1821) Helisoma anceps (Menke, 1830)	101.05417	42.68194	Powderhorn Valley	Cherry
1992-3	Valvata tricarinata (Say, 1817) Stagnicola elodes (Say, 1821) Physella gyrina (Say, 1821) Helisoma anceps (Menke, 1830) Succinea ovalis Say, 1817	101.67611	42.91528	Merriman	Cherry

MOLLUSKS COLLECTED ON THE NIOBRARA RIVER

COLLECTION SITE	TAXA	LONGITUDE	LATITUDE	USGS 7.5 MIN. QUAD	COUNTY
	GASTROPODS COLLECTED (Cont.)				
1992-4	Physella gyrina (Say, 1821)	102.20917	42.63917	Rushville NW	Sheridan
1992-5	Fossaria obrussa (Say, 1825) Physella gyrina (Say, 1821) Succinea ovalis Say, 1817	103.81778	42.43194	Agate	Sioux
1992-6	Valvata tricarinata (Say, 1817) Physella gyrina (Say, 1821) Helisoma anceps (Menke, 1830) Oxyloma retusum (I. Lea, 1834)	103.07361	42.45833	Box Butte Reservoir	Dawes
1992-7	Fossaria obrussa (Say, 1825) Oxyloma retusum (I. Lea, 1834)	103.07361	42.45833	Box Butte Reservoir	Dawes
1992-8	Valvata tricarinata (Say, 1817) Stagnicola elodes (Say, 1821) Physella gyrina (Say, 1821) Helisoma anceps (Menke, 1830)	103.12111	42.46472	Box Butte Reservoir	Dawes
1992-9	Fossaria obrussa (Say, 1825) Physella gyrina (Say, 1821) Oxyloma retusum (I. Lea, 1834)	98.11778	42.69028	Verdigre NE	Knox
1992-11	Succinea ovalis Say, 1817 Anguispira alternata (Say, 1816)	98.05028	42.76361	Niobrara	Knox
1992-12	Oxyloma retusum (I. Lea, 1834)	98.04722	42.76361	Niobrara	Knox

Table 1.

MOLLUSKS COLLECTED ON THE NIOBRARA RIVER

COLLECTION SITE	TAXA	LONGITUDE	LATITUDE	USGS 7.5 MIN. QUAD	COUNTY
	GASTROPODS COLLECTED (Cont.)				
1992-13	Succinea ovalis Say, 1817 Paravitrea simpsoni (Pilsbry, 1889) Anguispira alternata (Say, 1816) Stenotrema leai (A. Binney, 1840)	98.05028	42.76361	Niobrara	Knox
1993-1	Physella gyrina (Say, 1821) Succinea ovalis Say, 1817 Stenotrema leai (A. Binney, 1840)	99.15250	42.85500	Naper SW	Holt
1993-2	Fossaria obrussa (Say, 1825) Physella gyrina (Say, 1821) Succinea ovalis Say, 1817	98.33056	42.77000	Monowi	Boyd
1993-3	Physella gyrina (Say, 1821) Oxyloma retusum (I. Lea, 1834) Succinea ovalis Say, 1817 Stenotrema leai (A. Binney, 1840)	98.05028	42.76361	Niobrara	Knox

Table 1.

Fig. 1

NEBRASKA COUNTIES

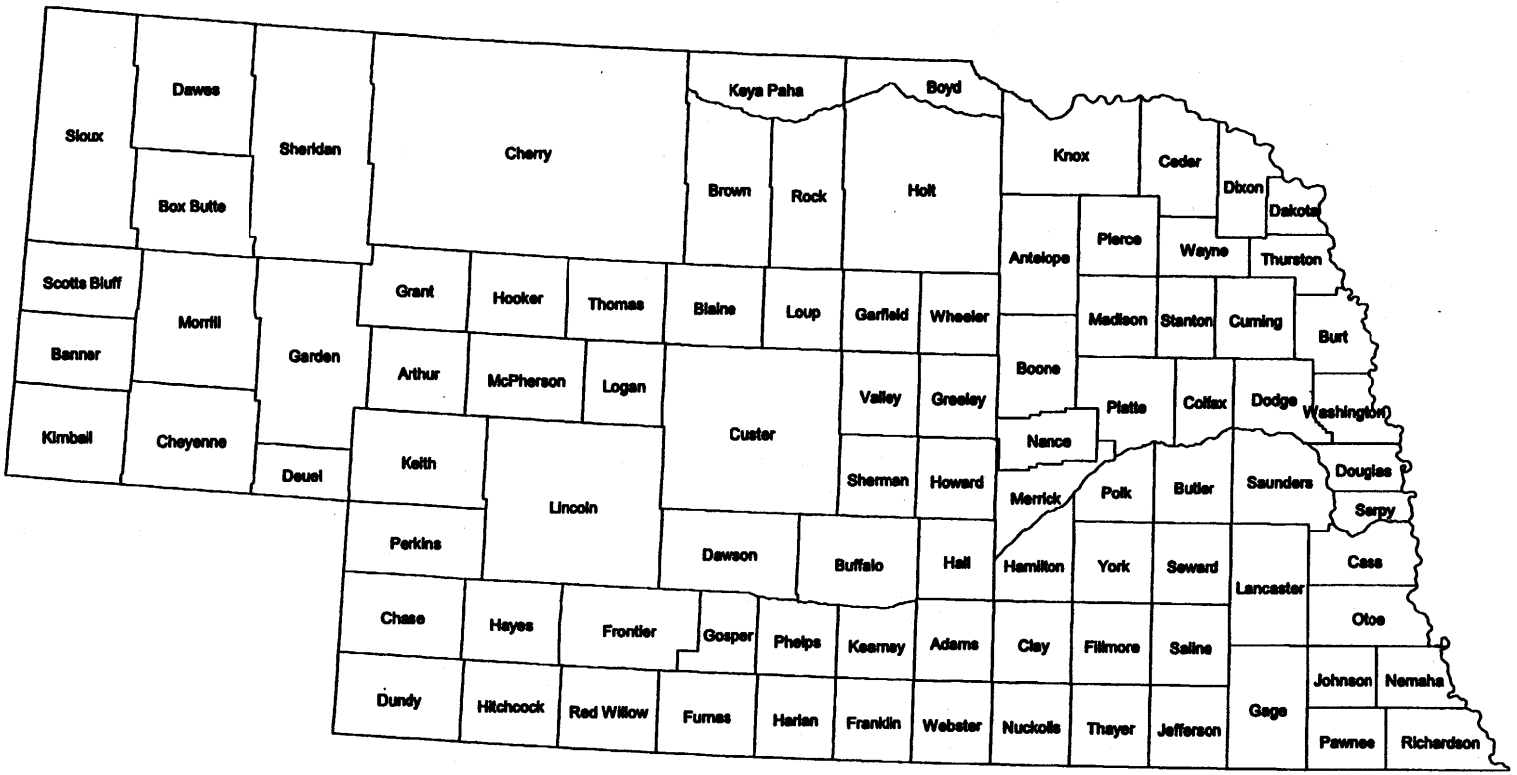

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Fig. 2

SITES SURVEYED FOR MOLLUSCS

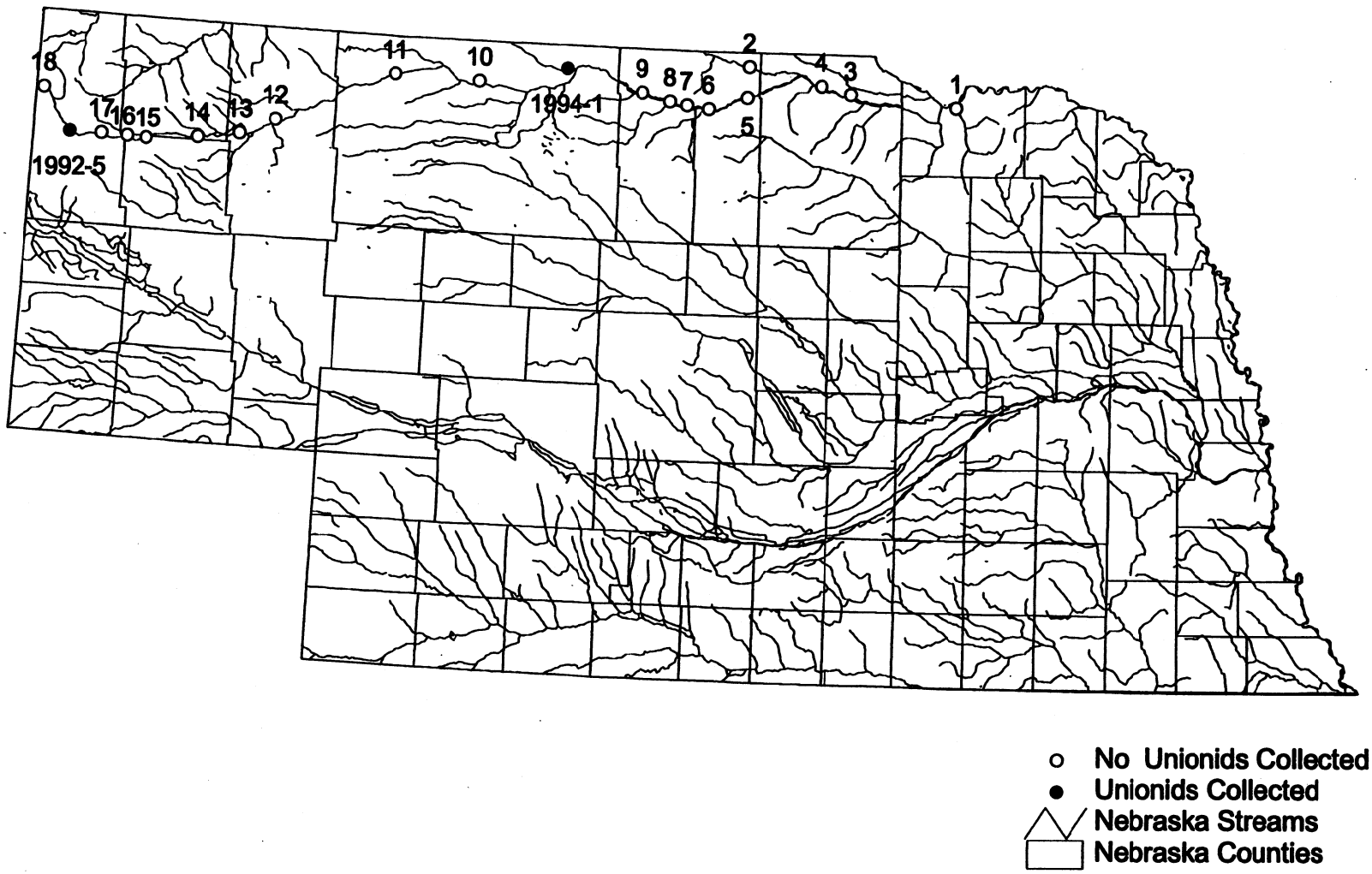

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Fig. 3

Anodonta grandis grandis Say, 1829

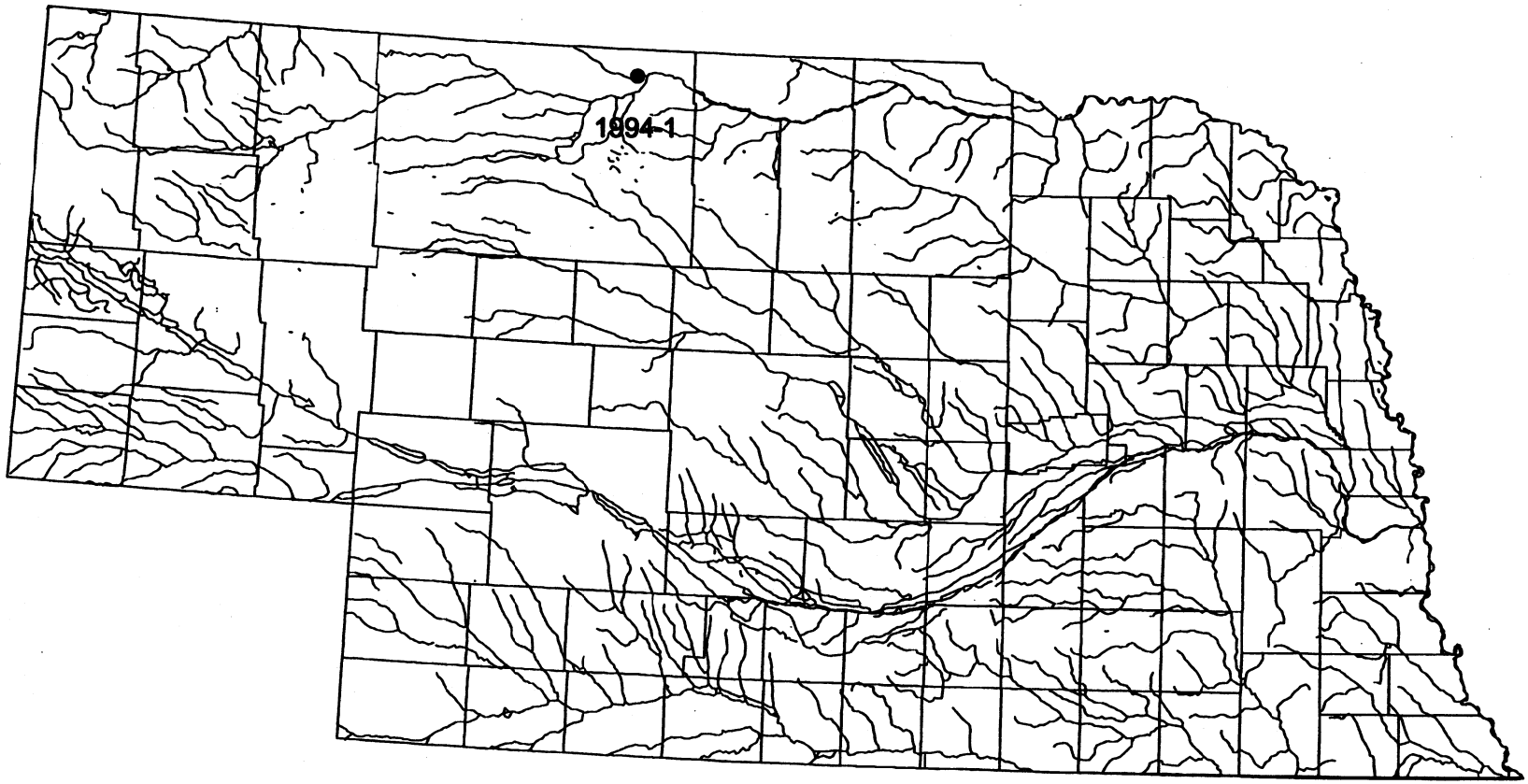

Fig. 4

Strophitus undulatus undulatus (Say, 1817)

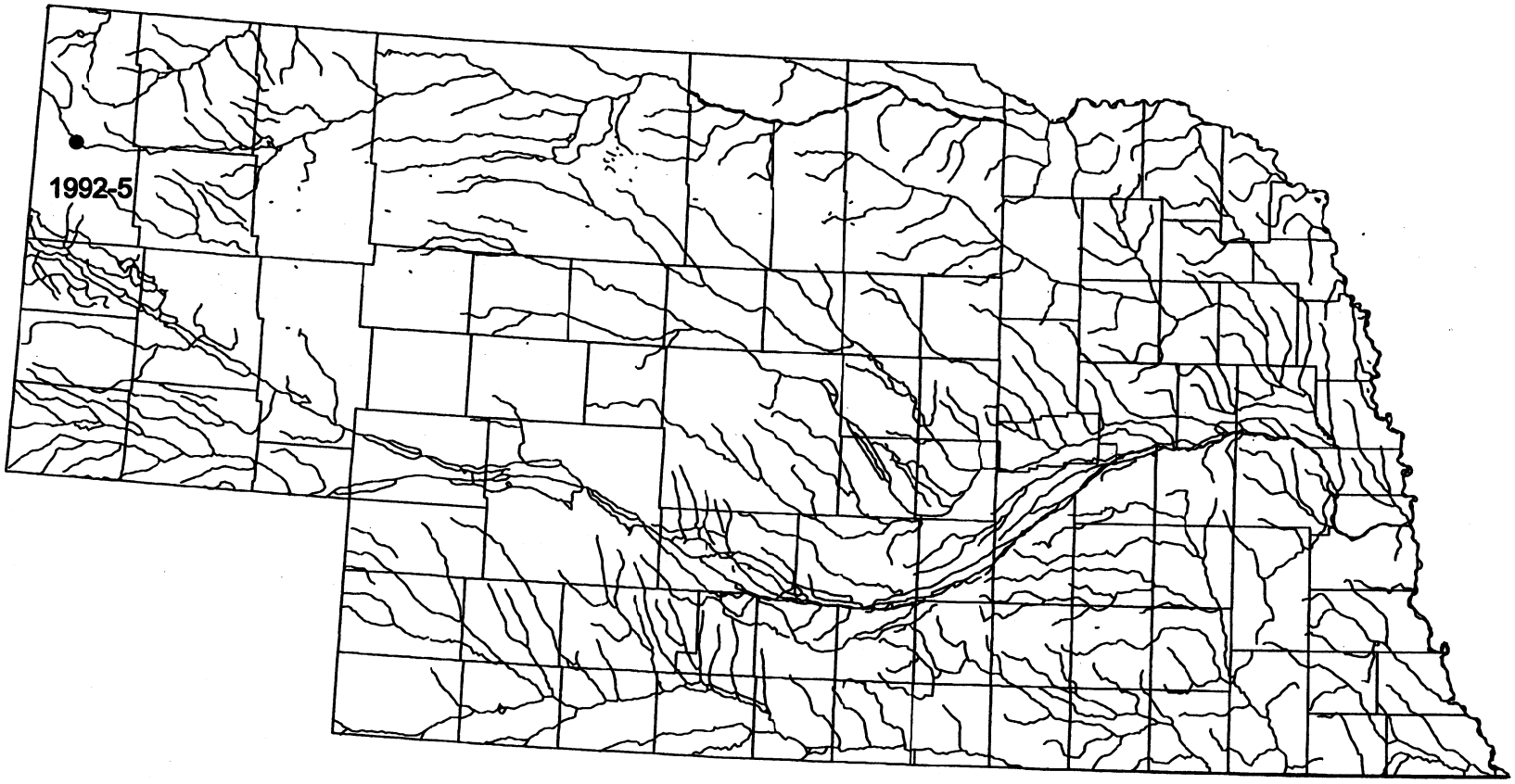

Fig. 5

Valvata tricarinata (Say, 1817)

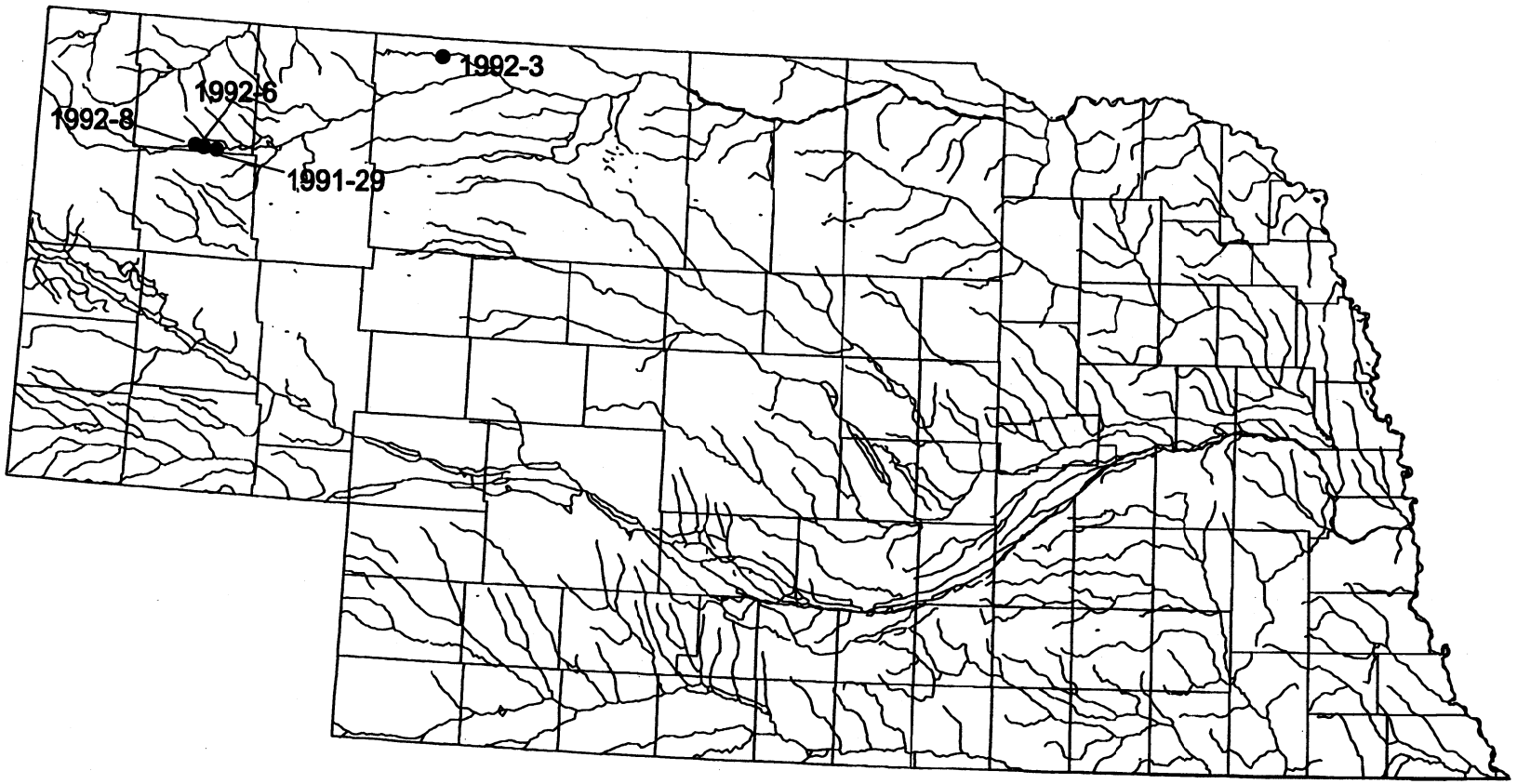

Fig. 6

Fossaria obrussa (Say, 1825)

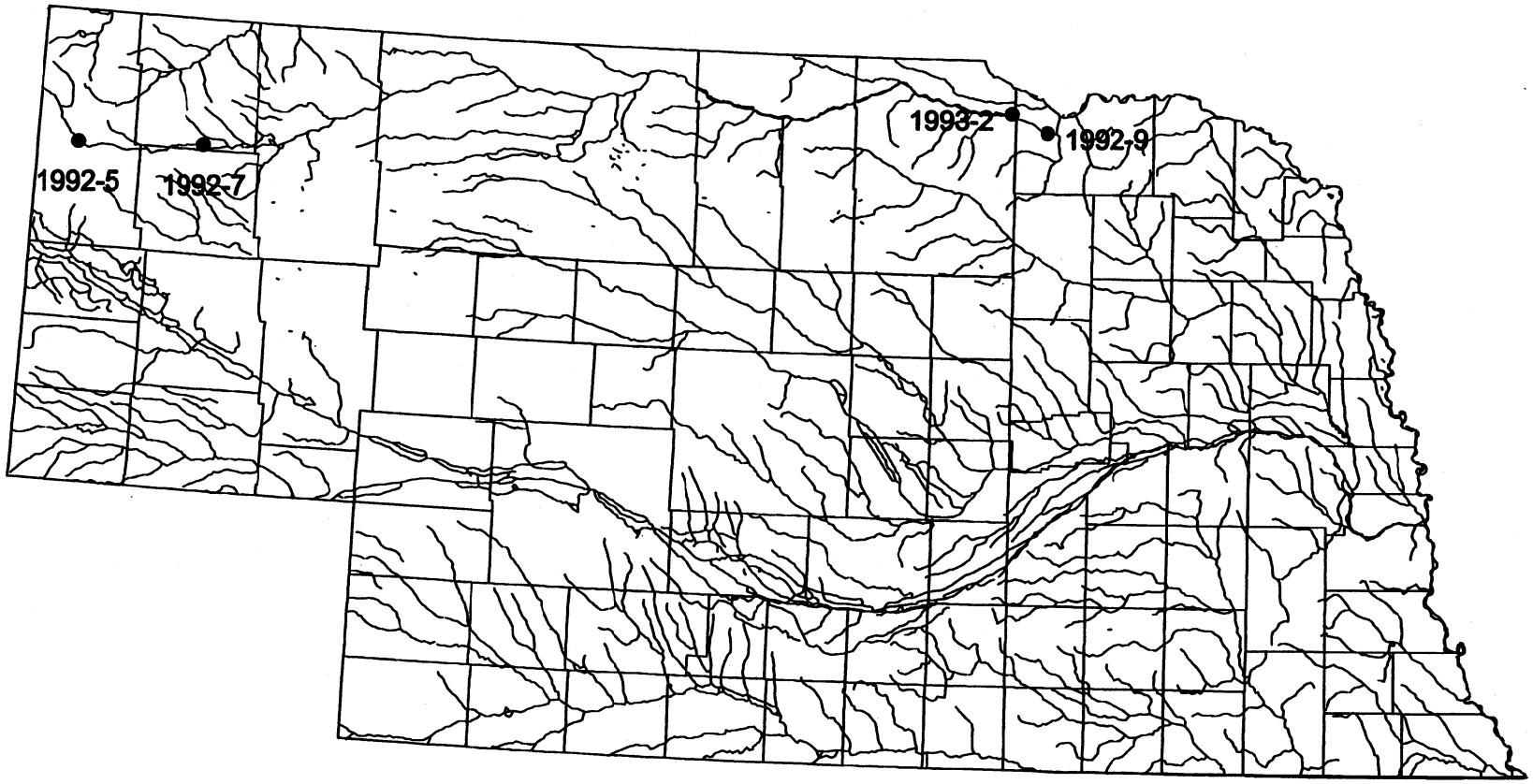

Fig. 7

Stagnicola elodes (Say, 1821)

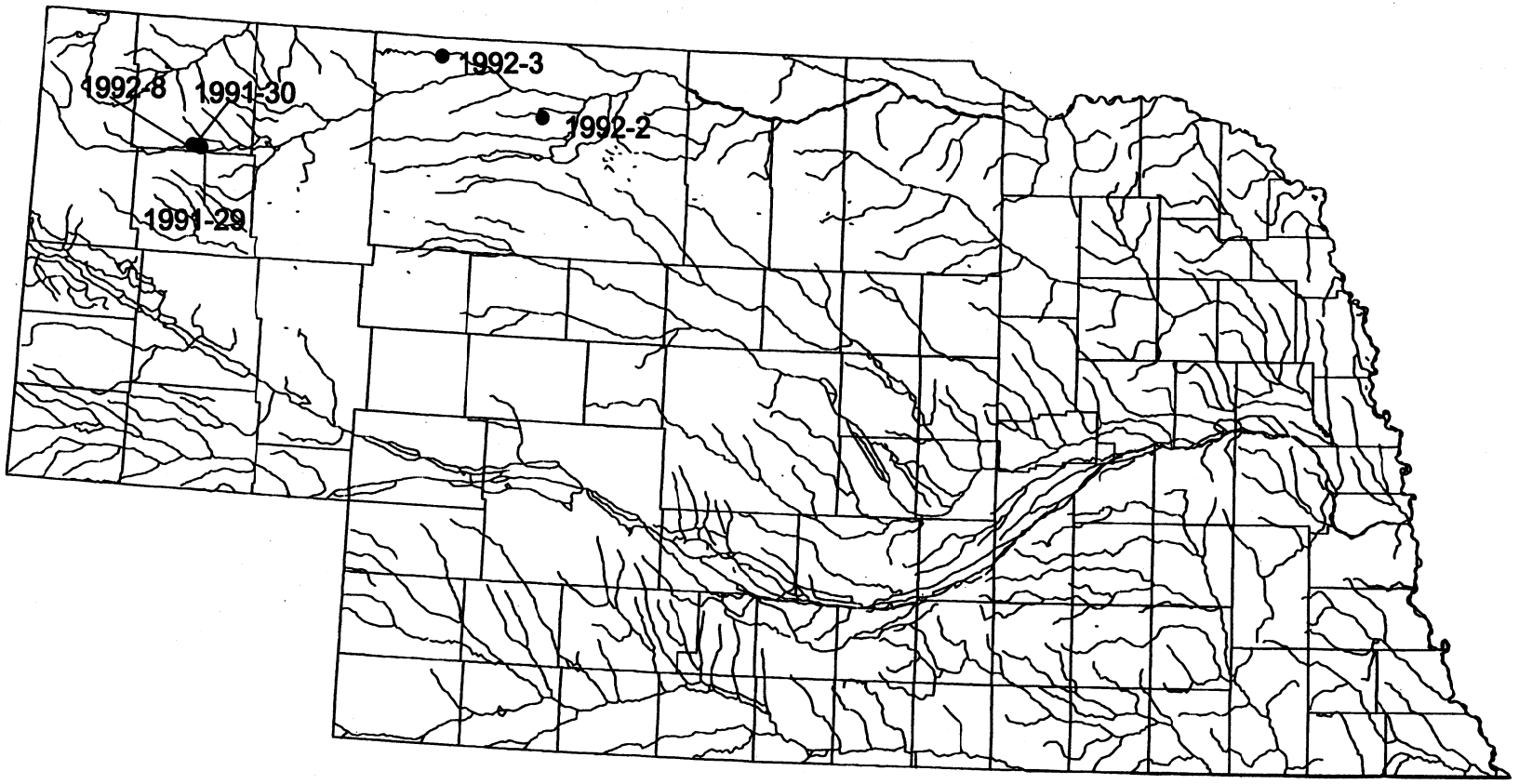

Fig. 8

Physella gyrina (Say, 1821)

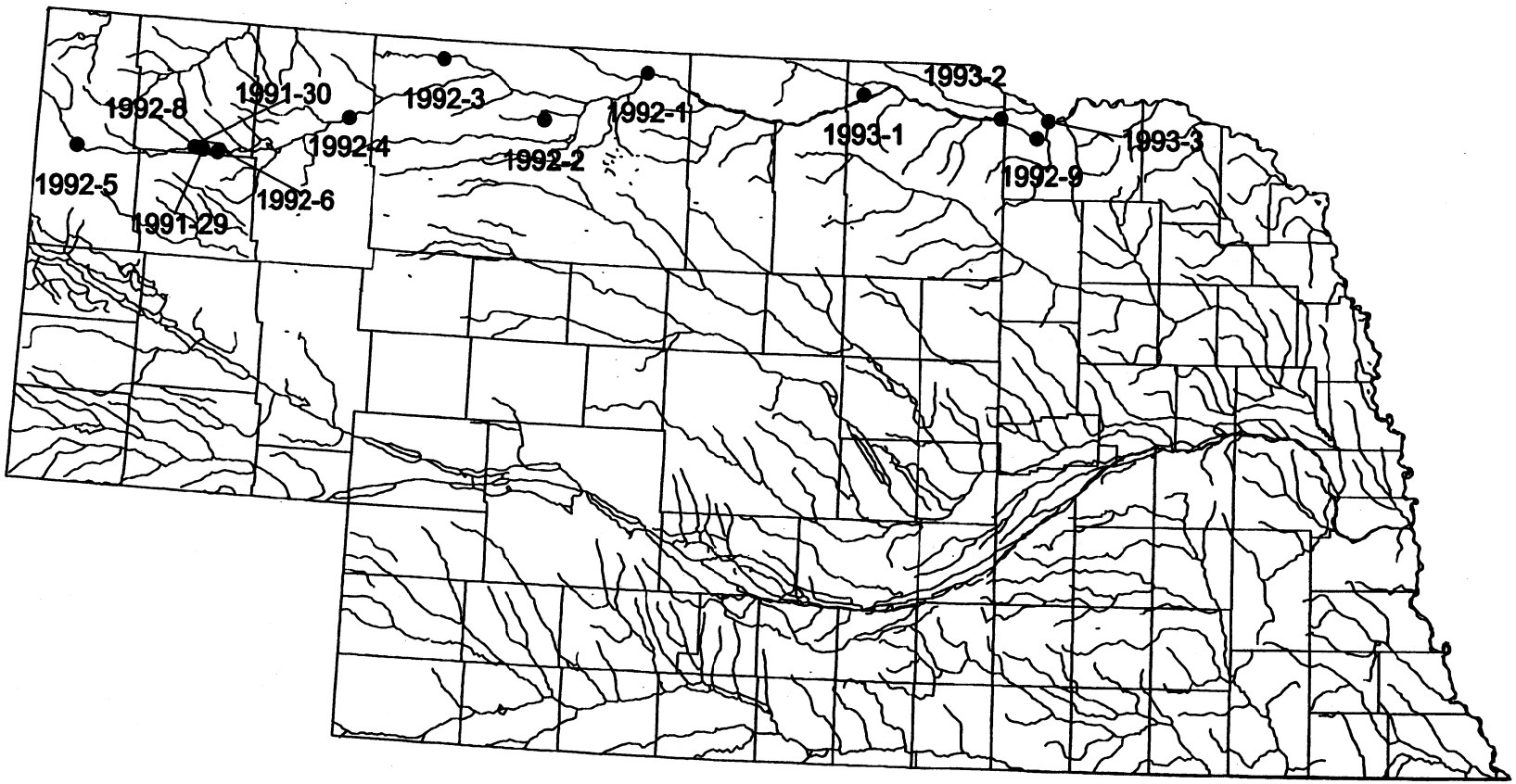

Fig. 9

Helisoma anceps (Menke, 1830)

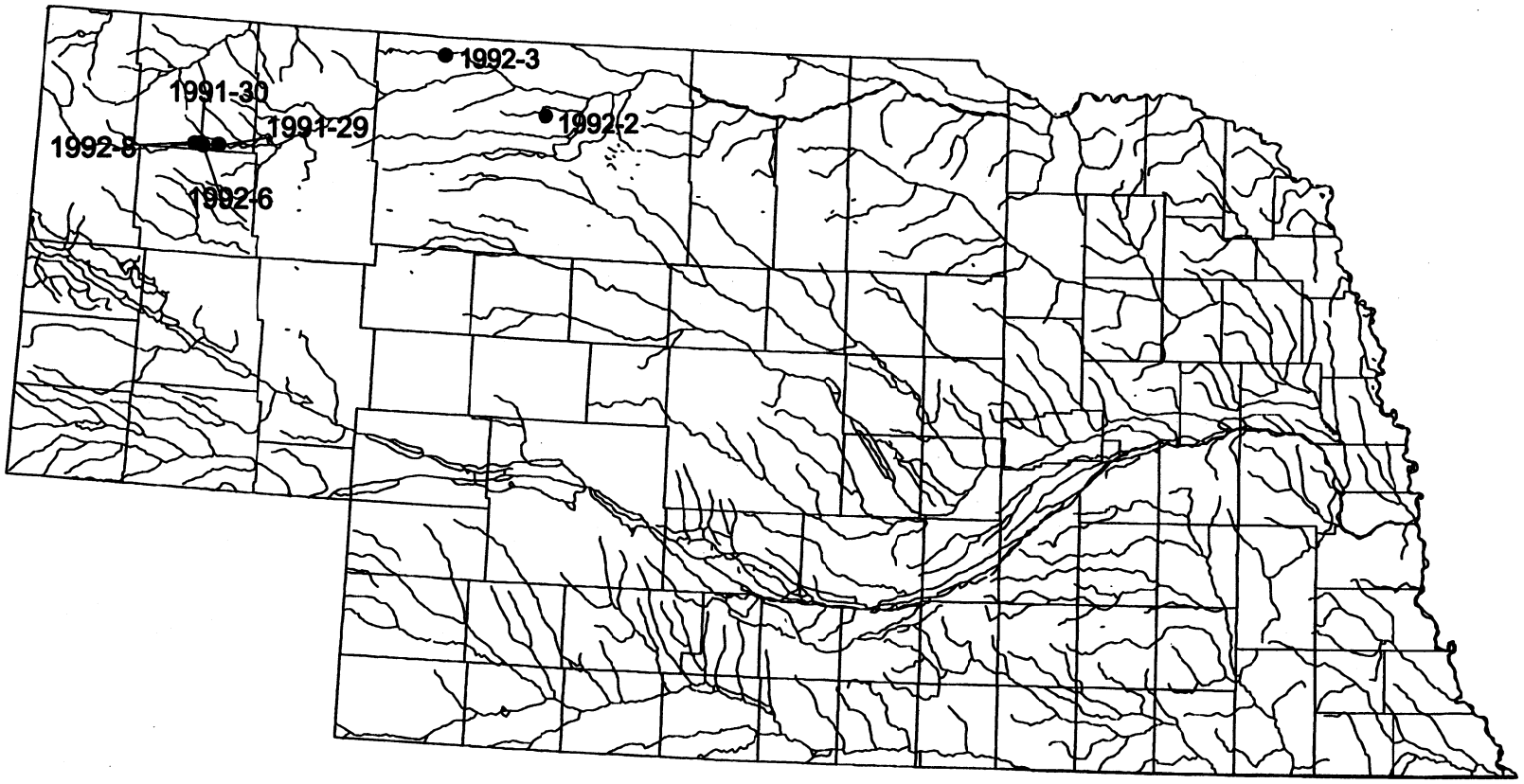

Fig. 10

Oxyloma retusum (I. Lea, 1834)

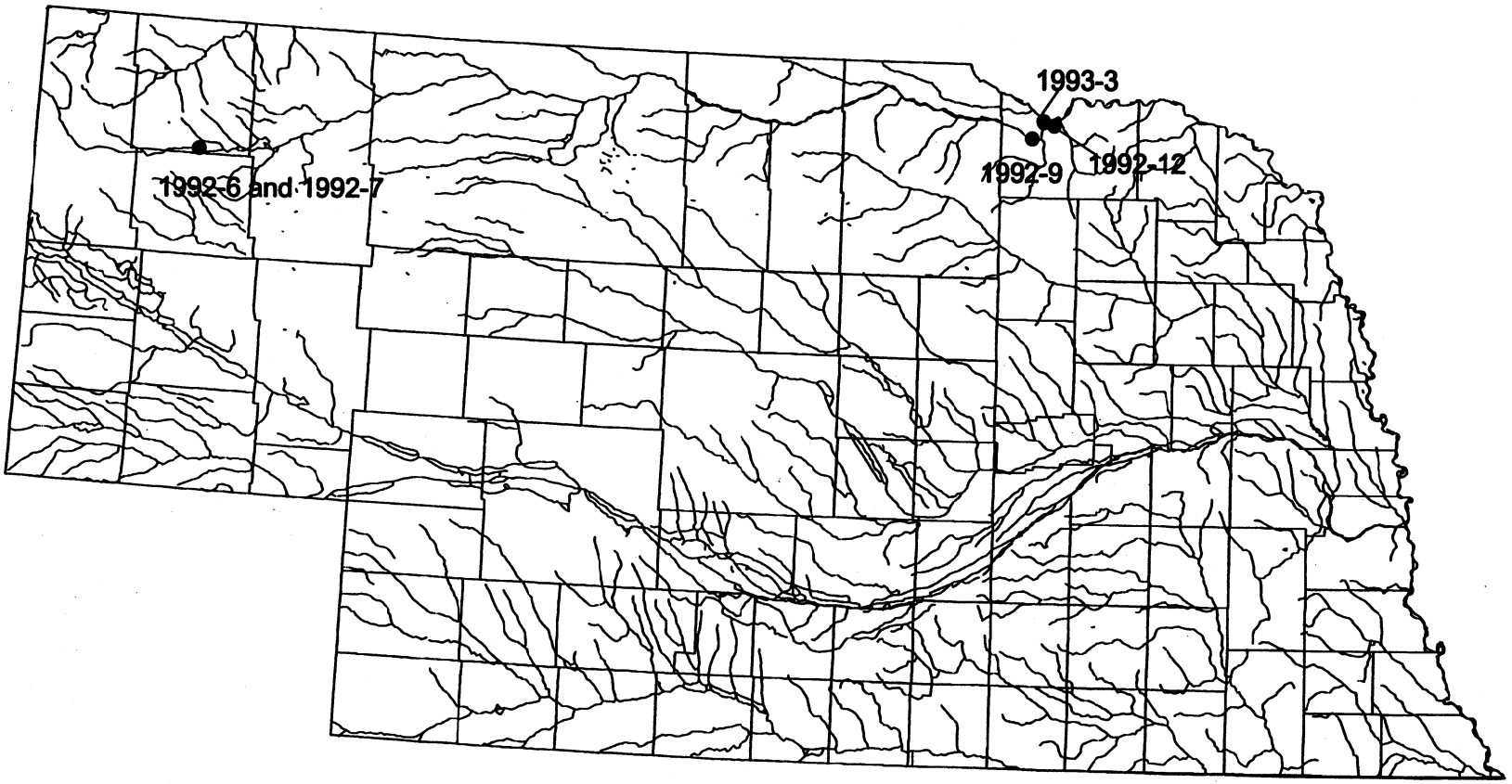

Fig. 11

Succinea ovalis Say, 1817

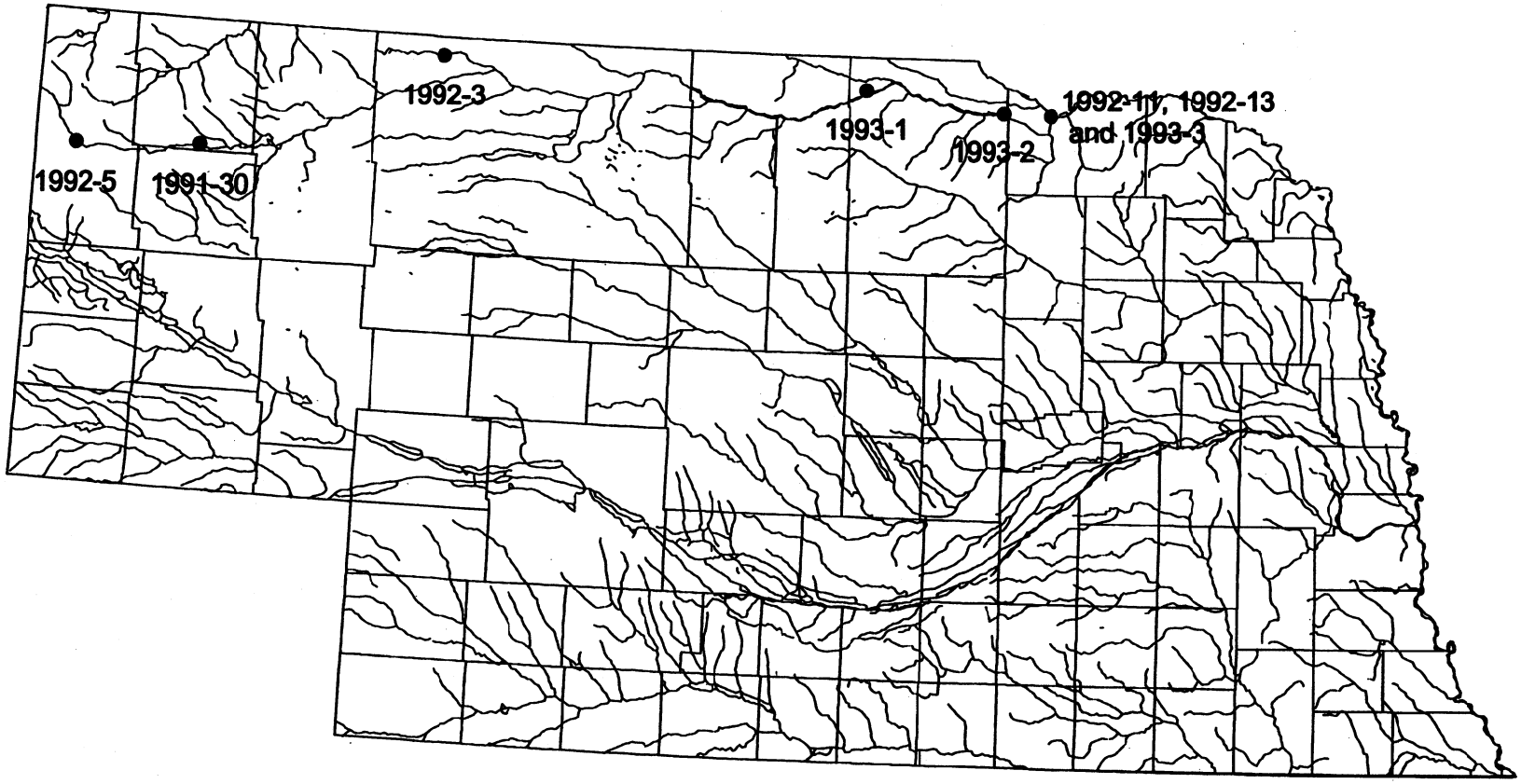

Fig. 12

Paravitrea simpsoni (Pilsbry, 1889)

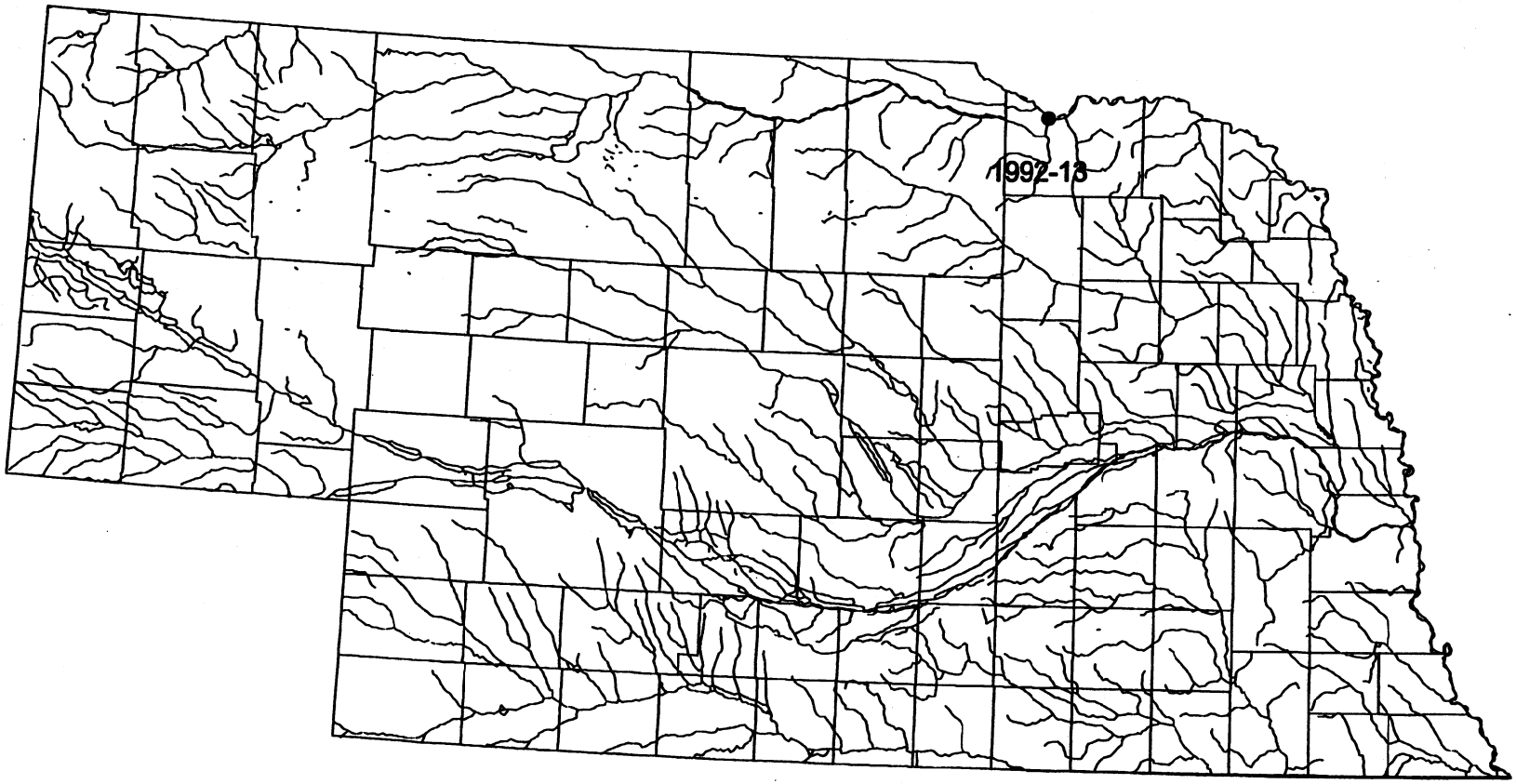

Fig. 13

Anguispira alternata (Say, 1816)

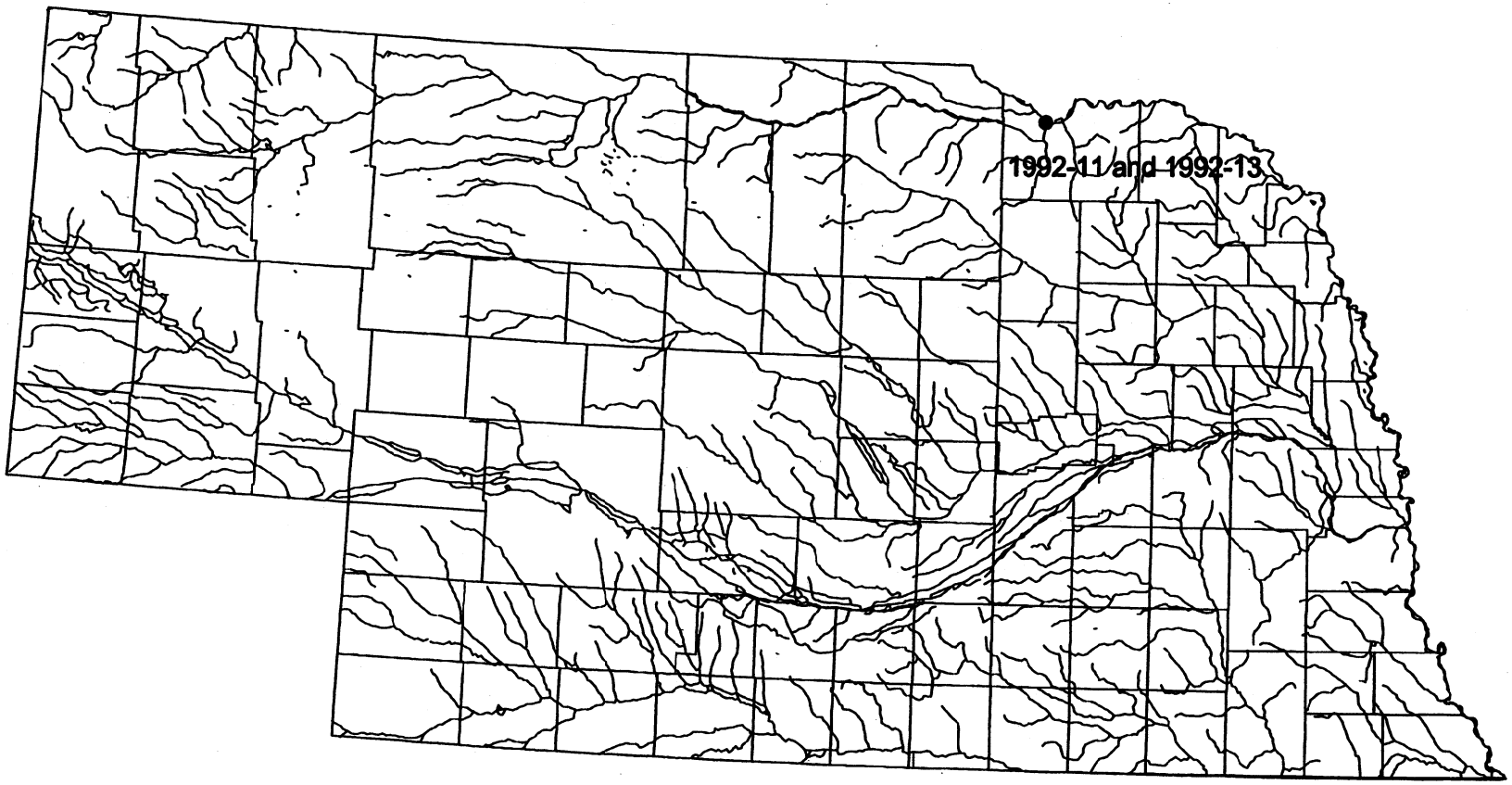

Fig. 14

Stenotrema leai (A. Binney, 1840)